91. (Amended) A computer program product as claimed in claim 63, wherein the computer program product comprises a plurality of techniques for generating the second vectors and means for selecting one of the techniques in response to user input.

A3 cont.

REMARKS

This application has been carefully reviewed in light of the Office Action dated October 10, 2001 (Paper No. 7). Claims 1 to 29, 32 to 60 and 63 to 91 are in the application, with Claims 1, 32 and 63 being the independent claims. Reconsideration and further examination are respectfully requested.

Claims 30, 31, 61, 62, 92 and 93, which were withdrawn from further consideration as being directed to a non-elected invention, have been canceled without prejudice or disclaimer of the subject matter contained therein.

A Letter Transmitting Formal Drawings accompanies this Amendment, with which formal drawings are being submitted to attend to the objections entered by the Draftsperson on the Notice Of Draftsperson's Patent Drawing Review dated December 23, 1999.

Turning to the claims, Applicants thank the Examiner for the indication that Claims 4 to 29, 35 to 60 and 66 to 91 contain allowable subject matter and would be allowable if rewritten in independent form. Applicants have not rewritten these claims, however, since it is believed that all claims currently pending in the application are in condition for allowance, as discussed in detail below.

Claims 1 to 3, 32 to 34 and 63 to 65 were rejected under 35 U.S.C. § 103(a) over U.S. Patent No. 6,268,871 (Rice). Applicants have carefully reviewed the Examiner's remarks and the applied reference and respectfully submit that the claims herein are patentably distinguishable over the applied reference for at least the following reasons.

The present invention concerns the orientation of a space curve having two endpoints. The space curve has one of two directions, either a forward direction proceeding along the space curve from an initial endpoint to a terminating endpoint or a reverse direction proceeding along the space curve from the terminating endpoint to the initial endpoint. By comparing a first vector that has a direction in the same direction as a selected desired direction and a second vector that has a direction indicative of a corresponding characteristic of the space curve, a direction of the space curve that is closest in direction to the selected desired direction is determined and the space curve is orientated in accordance with the determined direction. In this manner, space curves can be orientated in a consistent manner.

With reference to particular claim language, independent Claims 1, 32 and 63 concern orientating a space curve, where the space curve has two endpoints. A desired direction is selected and a first vector having a direction which is the same as the selected desired direction is generated. At least one second vector is generated, where each second vector has a corresponding direction indicative of a corresponding characteristic of the space curve. The first and second vectors are compared so as to determine a direction of the space curve. The space curve has one of two directions, either a forward direction proceeding along the space curve from an initial endpoint to a terminating endpoint or a

reverse direction proceeding along the space curve from the terminating endpoint to the initial endpoint. The determined direction of the space curve is a direction along the space curve from a first endpoint to a second endpoint that is closest in direction to the selected desired direction. The direction of the space curve is then orientated in accordance with the determined direction.

The applied reference is not understood to disclose or even suggest the foregoing features of the present invention. In particular, Rice is not understood to disclose or suggest at least the features of comparing a first vector having a direction the same as a selected desired direction and a second vector having a direction indicative of a corresponding characteristic of a space curve to determine a direction of the space curve that is closest in direction to the selected desired direction, and orientating the space curve in accordance with the determined direction, where the space curve has one of two directions, either a forward direction proceeding along the space curve from an initial endpoint to a terminating endpoint or a reverse direction proceeding along the space curve from the terminating endpoint to the initial endpoint.

Rice concerns the generation of a curve through points, where the curve follows geometric conditions set for at least one of the points. The geometric conditions include constraining the curve to pass through a point and constraining the curve to pass through a point while being parallel to a specified direction. However, Rice is not understood to disclose the generated curve having either a forward direction or a reverse direction. As a result, Rice could not possibly disclose orientating the generated curve in

accordance with a determined direction, the direction being either a forward direction or a reverse direction.

The Office Action concedes that Rice does not disclose the feature of comparing a first vector and a second vector to determine a direction of the space curve that is closest in direction to a selected desired direction. However, the Office Action asserts that this feature would have been obvious to one skilled in the art in view of Rice's disclosure of implementing geometric continuity conditions to ensure the location of a generated vector with that of underlying geometry. Applicants respectfully disagree with this assertion and submit that the implementation of geometric continuity conditions for generating a curve is not the same as comparing vectors to determine either a forward direction or a reverse direction of a space curve that is closest in direction to a selected desired direction.

Therefore, Rice is not understood to disclose or suggest at least the features of comparing a first vector having a direction the same as a selected desired direction and a second vector having a direction indicative of a corresponding characteristic of a space curve to determine a direction of the space curve that is closest in direction to the selected desired direction, and orientating the space curve in accordance with the determined direction, where the space curve has one of two directions, either a forward direction proceeding along the space curve from an initial endpoint to a terminating endpoint or a reverse direction proceeding along the space curve from the terminating endpoint to the initial endpoint.

Accordingly, independent Claims 1, 32 and 63 are believed to be allowable over the applied reference. Reconsideration and withdrawal of the § 103(a) rejection of Claims 1, 32 and 63 are respectfully requested.

The other rejected claims in the application are each dependent from the independent claims discussed above and are therefore believed to be allowable for at least the same reasons. Because each dependent claim is deemed to define an additional aspect of the present invention, however, the individual consideration of each on its own merits is respectfully requested.

In view of the foregoing amendment and remarks, the entire application is believed to be in condition for allowance and such action is respectfully requested at the Examiner's earliest convenience.

Regarding a formal matter, the Examiner is respectfully requested to consider the art cited in the Information Disclosure Statement dated February 25, 2002, and indicate that that art has been considered and made formally of record by returning an initialed copy of the form PTO-1449 that accompanied the Information Disclosure Statement.

Applicants' undersigned attorney may be reached in our Costa Mesa, California, office at (714) 540-8700. All correspondence should continue to be directed to our below-listed address.

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE TO CLAIMS

1. (Amended) A method of orientating a space curve, wherein the space curve has two endpoints, the method comprising the steps of:

[(i)] selecting a desired direction;

[(ii)] generating a first vector having a direction which is the same as the selected desired direction;

[(iii)] generating at least one second vector, each [said] second vector having a corresponding direction indicative of a corresponding characteristic of the space curve;

[(iv)] comparing the first and second vectors so as to determine a direction of [said] the space curve, wherein the space curve has one of two directions, either a forward direction proceeding along the space curve from an initial endpoint to a terminating endpoint or a reverse direction proceeding along the space curve from the terminating endpoint to the initial endpoint, and wherein the [said] determined direction of [said] the space curve is a direction along [said] the space curve from a first [said] endpoint to a second [said] endpoint [and which] that is closest in direction to [said] the selected desired direction; and

[(v)] orientating [said] the direction of [said] the space curve in accordance with [said] the determined direction.

2. (Amended) A method as claimed in claim 1, wherein said step [(iii)] of generating at least one second vector comprises the sub-steps of:

[(iii)(a)] determining [said] the endpoints of [said] the space curve; and

[(iii)(b)] generating one [said] second vector connecting both [said] endpoints.

3. (Amended) A method as claimed in claim 1, wherein said step [(iii)] of generating at least one second vector comprises the substeps of:

[(iii)(a)] determining [said] the endpoints of [said] the space curve; and

[(iii)(b)] generating two [said] second vectors, each connecting both [said] endpoints and having opposite directions.

4. (Amended) A method as claimed in claim 3, wherein said comparing step [(iv)] comprises the sub-steps of[;]:

[(iv)(a)] determining a first angle between one of [said] the second vectors and [said] the first vector;

[(iv)(b)] determining a second angle between the other one of [said] the second vectors and [said] the first vector; and

[(iv)(c)] comparing [said] the first angle with [said] the second angle[;],

wherein if [said] the first angle is less than [said] the second angle then the determined direction of the space curve is in a first direction, and if [said] the first angle is

greater than [said] the second angle then the determined direction of the space curve is in a second direction, opposite the first direction.

5. (Amended) A method as claimed in claim 2, wherein said comparing step [(iv)] comprises the sub-steps of:

[(iv)(a)] determining a first angle between [said] the first vector and [said] the second vector; and

[(iv)(b)] comparing [said] the first angle with a first threshold value[;],

wherein if [said] the first angle is less than [said] the first threshold value then the determined direction of the space curve is in a first direction, and if [said] the first angle is greater than [said] the first threshold value then the determined direction of the space curve is in a second direction, opposite the first direction.

6. (Amended) A method as claimed in claim 5, wherein [said] the first threshold value is 90°.

7. (Amended) A method as claimed in claim 4, wherein [said] the method further comprises the step of generating a vector orthogonal to [said] the first vector.

8. (Amended) A method as claimed in claim 5, wherein [said] the method further comprises the step of generating a vector orthogonal to [said] the first vector.

9. (Amended) A method as claimed in claim 7 or 8, wherein [said] the orthogonal vector is generated in a predetermined manner.

10. (Amended) A method as claimed in claim 7 or 8, wherein [said] the orthogonal vector is generated in accordance with a user selected direction.

11. (Amended) A method as claimed in claim 7, wherein, if [said] the first angle equals [said] the second angle, [the] said comparing step [(iv)] further comprises the sub-steps of:

[(iv)(d)] determining a third angle between one of [said] the second vectors and [said] the orthogonal vector;

[(iv)(e)] determining a fourth angle between the other one of [said] the second vectors and [said] the orthogonal vector; and

[(iv)(f)] comparing [said] the third angle with [said] the fourth angle,

wherein if [said] the third angle is less than [said] the fourth angle then the determined direction of the space curve is in a third direction, and if [said] the third angle is greater than [said] the fourth angle then the determined direction of the space curve is in a fourth direction, opposite the third direction.

12. (Amended) A method as claimed in claim 8, wherein[,] if [said] the first angle equals [said] the first threshold value, [the] said comparing step [(iv)] further comprises the sub-steps of:

[(iv)(c)] determining a second angle between [said] the second vector and [said] the orthogonal vector; and

[(iv)(d)] comparing [said] the second angle with a second threshold value[;],

wherein if [said] the second angle is less than [said] the second threshold value then the determined direction of the space curve is in a third direction, and if [said] the second angle is greater than [said] the second threshold value then the determined direction of the space curve is in a fourth direction, opposite the third direction.

13. (Amended) A method as claimed in claim 12, wherein [said] the second threshold value is 90°.

14. (Amended) A method as claimed in claim 1, wherein said step [(iii)] generating at least one second vector comprises the substeps of:

[(iii)(a)] determining endpoints of [said] the space curve; and

[(iii)(b)] generating, at each [said] endpoint, a [said] second vector tangent to [said] the space curve.

15. (Amended) A method as claimed in claim 14, wherein said comparing step [(iv)] comprises the sub-steps of[;]:

[(iv)(a)] determining a first angle between one of [said] the second vectors and [said] the first vector;

[(iv)(b)] determining a second angle between the other one of [said] the

second vectors and [said] the first vector; and

[(iv)(c)] comparing [said] the first angle with [said] the second angle[;], wherein if [said] the first angle is less than [said] the second angle then the determined direction of the space curve is in a first direction, and if [said] the first angle is greater than [said] the second angle then the determined direction of the space curve is in a second direction, opposite the first direction.

16. (Amended) A method as claimed in claim 15, wherein said step [(iii)] of generating at least one second vector further comprises the sub-step[s] of[: (iii)(c)] generating [one said] a third vector connecting both [said] endpoints.

17. (Amended) A method as claimed in claim 15, wherein said step [(iii)] of generating at least one second vector further comprises the sub-step[s] of[: (iii)(c)] generating two [said] third vectors, each connecting both [said] endpoints and having opposite directions.

18. (Amended) A method as claimed in claim 17, wherein said comparing step [(iv)] further comprises the sub-steps of[;]:

[(iv)(d)] determining a third angle between one of [said] the third vectors and [said] the first vector;

[(iv)(e)] determining a fourth angle between the other one of [said] the third vectors and [said] the first vector; and

[(iv)(f)] comparing [said] the third angle with [said] the fourth angle[;],

wherein if [said] the third angle is less than [said] the fourth angle then the determined direction of the space curve is in a third direction, and if [said] the third angle is greater than [said] the fourth angle then the determined direction of the space curve is in a fourth direction, opposite the third direction.

19. (Amended) A method as claimed in claim 16, wherein said comparing step [(iv)] comprises the sub-steps of:

[(iv)(d)] determining a third angle between [said] the third vector and [said] the first vector; and

[(iv)(e)] comparing [said] the third angle with a first threshold value[;],

wherein if [said] the third angle is less than [said] the first threshold value then the determined direction of the space curve is in a third direction, and if [said] the third angle is greater than [said] the first threshold value then the determined direction of the space curve is in a fourth direction, opposite the third direction.

20. (Amended) A method as claimed in claim 19, wherein [said] the first threshold value is 90°.

21. (Amended) A method as claimed in claim 18, wherein said step [(iii)] of generating at least one second vector comprises the sub-step of[: (iii)(a)] generating a vector orthogonal to [said] the first vector.

22. (Amended) A method as claimed in claim 19, wherein said step [(iii)] of generating at least one second vector comprises the sub-step of[: (iii)(a)] generating a vector orthogonal to [said] the first vector.

23. (Amended) A method as claimed in claim 21 or 22, wherein [said] the orthogonal vector is generated in a predetermined manner.

24. (Amended) A method as claimed in claim 21 or 22, wherein [said] the orthogonal vector is generated in accordance with a user selected direction.

25. (Amended) A method as claimed in claim 21, wherein[,] if [said] the third angle equals [said] the fourth angle, [the] said comparing step further comprises the [following] sub-steps of:

[(iv)(g)] determining a fifth angle between [said] the first one of [said] the third vectors and [said] the orthogonal vector;

[(iv)(h)] determining a sixth angle between [said] the other one of [said] the third vectors and [said] the orthogonal vector; and

[(iv)(i)] comparing [said] the fifth angle with [said] the sixth angle,

wherein if [said] the fifth angle is less than [said] the sixth angle then the determined direction of the space curve is in a fifth direction, and if [said] the fifth angle is greater than [said] the sixth angle then the determined direction of the space curve is in a sixth direction, opposite the fifth direction.

26. (Amended) A method as claimed in claim 22, wherein[,] if [said] the third angle equals [said] the first threshold value, [the] said comparing step [(iv)] comprises the [following] sub-steps of:

[(iv)(f)] determining a fourth angle between [said] the third vector and [said] the orthogonal vector; and

[(iv)(g)] comparing [said] the fourth angle with a second threshold value[;],

wherein if [said] the fourth angle is less than [said] the second threshold value then the determined direction of the space curve is in a fourth direction, and if [said] the fourth angle is greater than [said] the second threshold value then the determined direction of the space curve is in a fifth direction, opposite the fourth direction.

27. (Amended) A method as claimed in claim 26, wherein [said] the second threshold value is 90°.

28. (Amended) A method as claimed in claim 1, wherein the method comprises the step of providing further space curves and performing [the] said step[s (iii) to (v)] of generating at least one second vector and said comparing step on each space curve.

29. (Amended) A method as claimed in claim 1, wherein the method comprises a plurality of techniques for generating the second vectors and a step for selecting one of [said] the techniques in response to user input.

30. (Canceled)

31. (Canceled)

32. (Amended) An a[A]pparatus for orientating a space curve, wherein the space curve has two endpoints, the apparatus comprising:

selection means for selecting a desired direction;

first generation means for generating a first vector having a direction which is the same as the selected desired direction;

means for providing [a] the space curve;

second generation means for generating at least one second vector, each [said] second vector having a corresponding direction indicative of a corresponding characteristic of the space curve;

comparing means for comparing the first and second vectors so as to determine a direction of [said] the space curve, wherein the space curve has one of two directions, either a forward direction proceeding along the space curve from an initial endpoint to a terminating endpoint or a reverse direction proceeding along the space curve from the terminating endpoint to the initial endpoint, and wherein the [said] determined direction of [said] space curve is a direction along [said] the space curve from a first [said] endpoint to a second [said] endpoint [and which] that is closest in direction to [said] the selected desired direction; and

orientation means for orientating [said] the direction of [said] the space curve in accordance with [said] the determined direction.

33. (Amended) An a[A]pparatus claimed in claim 32, wherein said second generation means comprises:

means for determining [said] the endpoints of [said] the space curve; and

means for generating [one said] a second vector connecting both [said] endpoints.

34. (Amended) An a[A]pparatus as claimed in claim 32, wherein said second generating means comprises:

means for determining [said] the endpoints of [said] the space curve; and

means for generating two [said] second vectors, each connecting both [said] endpoints and having opposite directions.

35. (Amended) An a[A]pparatus as claimed in claim 34, wherein said first comparison means comprises:

means for determining a first angle between one of [said] the second vectors and [said] the first vector;

means for determining a second angle between the other one of [said] the second vectors and [said] the first vector;

means for comparing [said] the first angle with [said] the second angle[;],

wherein if [said] the first angle is less than [said] the second angle then the determined direction of the space curve is in a first direction, and if [said] the first angle is greater than [said] the second angle then the determined direction of the space curve is in a second direction, opposite the first direction.

36. (Amended) An a[A]pparatus as claimed in claim 33, wherein said first comparison means comprises:

means for determining a first angle between [said] the first vector and [said] the second vector; and

means for comparing [said] the first angle with a first threshold value[;],

wherein if [said] the first angle is less than [said] the first threshold value then the determined direction of the space curve is in a first direction, and if [said] the first angle is greater than [said] the first threshold value then the determined direction of the space curve is in a second direction, opposite the first direction.

37. (Amended) An a[A]pparatus as claimed in claim 36, wherein [said] the first threshold value is 90°.

38. (Amended) An a[A]pparatus as claimed in claim 35, wherein [said] the apparatus further comprises means for generating a vector orthogonal to [said] the first vector.

39. (Amended) An a[A]pparatus as claimed in claim 36, wherein [said] the apparatus further comprises means for generating a vector orthogonal to [said] the first vector.

40. (Amended) An a[A]pparatus as claimed in claim 38 or 39, wherein [said] the orthogonal vector is generated in a predetermined manner.

41. (Amended) An a[A]pparatus as claimed in claim 38 or 39, wherein [said] the orthogonal vector is generated in accordance with a user selected direction.

42. (Amended) An a[A]pparatus as claimed in claim 38, wherein the first comparison means further comprises:

means for determining a third angle between one of [said] the second vectors and [said] the orthogonal vector;

means for determining a fourth angle between the other one of [said] the second vectors and [said] the orthogonal vector; and

means for comparing [said] the third angle with [said] the fourth angle,

wherein if [said] the third angle is less than [said] the fourth angle then the determined direction of the space curve is in a third direction, and if [said] the third angle is greater than [said] the fourth angle then the determined direction of the space curve is in a fourth direction, opposite the third direction.

43. (Amended) An a[A]pparatus as claimed in claim 39, wherein the first comparison means further comprises:

means for determining a second angle between [said] the second vector and [said] the orthogonal vector; and

means for comparing [said] the second angle with a second threshold value[;],

wherein if [said] the second angle is less than [said] the second threshold value then the determined direction of the space curve is in a third direction, and if [said] the second angle is greater than [said] the second threshold value then the determined direction of the space curve is in a fourth direction, opposite the third direction.

44. (Amended) An a[A]pparatus as claimed in claim 43, wherein [said] the second threshold value is 90°.

45. (Amended) An a[A]pparatus as claimed in claim 32, wherein said second generation means comprises:

means for determining endpoints of [said] the curve; and

means for generating, at each [said] endpoint, a [said] second vector tangent to [said] the curve.

46. (Amended) An a[A]pparatus as claimed in claim 45, wherein said first comparison means comprises:

means for determining a first angle between one of [said] the second vectors and [said] the first vector;

means for determining a second angle between the other one of [said] the second vectors and [said] the first vector; and

means for comparing [said] the first angle with [said] the second angle[;],

wherein if [said] the first angle is less than [said] the second angle then the determined direction of the space curve is in a first direction, and if [said] the first angle is greater than [said] the second angle then the determined direction of the space curve is in a second direction, opposite the first direction.

47. (Amended) An a[A]pparatus as claimed in claim 46, wherein said second generation means comprises[:] means for generating [one said] a third vector connecting both [said] endpoints.

48. (Amended) An a[A]pparatus as claimed in claim 46, wherein said second generation means further comprises[:] means for generating two [said] third vectors, each connecting both [said] endpoints and having opposite directions.

49. (Amended) An a[A]pparatus as claimed in claim 48, wherein said first comparison means further comprises:

means for determining a third angle between one of [said] the third vectors and [said] the first vector;

means for determining a fourth angle between the other one of [said] the third vectors and [said] the first vector; and

means for comparing [said] the third angle with [said] the fourth angle[;],

wherein if [said] the third angle is less than [said] the fourth angle then the determined direction of the space curve is in a third direction, and if [said] the third angle is greater than [said] the fourth angle then the determined direction of the space curve is in a fourth direction, opposite the third direction.

50. (Amended) An a[A]pparatus as claimed in claim 47, wherein said first comparison means comprises:

means for determining a third angle between [said] the third vector and [said] the first vector; and

means for comparing [said] the third angle with a first threshold value[;],

wherein if [said] the third angle is less than [said] the first threshold value then the determined direction of the space curve is in a third direction, and if [said] the third angle is greater than [said] the first threshold value then the determined direction of the space curve is in a fourth direction, opposite the third direction.

51. (Amended) An a[A]pparatus as claimed in claim 50, wherein [said] the first threshold value is 90°.

52. (Amended) An a[A]pparatus as claimed in claim 49, wherein said second generation means comprises[:] means for generating a vector orthogonal to [said] the first vector.

53. (Amended) An a[A]pparatus as claimed in claim 50, wherein said second generation means comprises[:] means for generating a vector orthogonal to [said] the first vector.

54. (Amended) An a[A]pparatus as claimed in claim 52 or 53, wherein [said] the orthogonal vector is generated in a predetermined manner.

55. (Amended) An a[A]pparatus as claimed in claim 52 or 53, wherein [said] the orthogonal vector is generated in accordance with a user selected direction.

56. (Amended) An a[A]pparatus as claimed in claim 52, wherein the first comparison means further comprises:

means for determining a fifth angle between [said] the first one of [said] the third vectors and [said] the orthogonal vector;

means for determining a sixth angle between [said] the other one of [said] the third vectors and [said] the orthogonal vector; and

means for comparing [said] the fifth angle with [said] the sixth angle,

wherein if [said] the fifth angle is less than [said] the sixth angle then the determined direction of the space curve is in a fifth direction, and if [said] the fifth angle is greater than [said] the sixth angle then the determined direction of the space curve is in a sixth direction, opposite the fifth direction.

57. (Amended) An a[A]pparatus as claimed in claim 53, wherein the first comparison means further comprises the following:

means for determining a fourth angle between [said] the third vector and [said] the orthogonal vector; and

means for comparing [said] the fourth angle with a second threshold value[;],

wherein if [said] the fourth angle is less than [said] the second threshold value then the determined direction of the space curve is in a fourth direction, and if [said] the fourth angle is greater than [said] the second threshold value then the determined direction of the space curve is in a fifth direction, opposite the fourth direction.

58. (Amended) An a[A]pparatus as claimed in claim 57, wherein [said] the second threshold value is 90°.

59. (Amended) An a[A]pparatus as claimed in claim 32, wherein the apparatus comprises means for providing further space curves and performing the

operations of [the] said second generation means, first comparison means and orientation means on each space curve.

60. (Amended) An a[A]pparatus as claimed in claim 32, wherein the apparatus comprises a plurality of techniques for generating the second vectors and means for selecting one of [said] the techniques in response to user input.

61. (Canceled)

62. (Canceled)

63. (Amended) A computer program product comprising a computer readable medium having a computer program for orientating a space curve, wherein the space curve has two endpoints, the computer program product comprising:

selection means for selecting a desired direction;

first generation means for generating a first vector having a direction which is the same as the selected desired direction;

means for providing a space curve;

second generation means for generating at least one second vector, each [said] second vector having a corresponding direction indicative of a corresponding characteristic of the space curve;

first comparison means for comparing the first and second vectors so as to determine a direction of [said] the space curve, wherein the space curve has one of two directions, either a forward direction proceeding along the space curve from an initial endpoint to a terminating endpoint or a reverse direction proceeding along the space curve from the terminating endpoint to the initial endpoint, and wherein the [said] determined direction of [said] the space curve is a direction along [said] the space curve from a first [said] endpoint to a second [said] endpoint [and which] that is closest in direction to [said] the selected desired direction; and

orientation means for orientating [said] the direction of [said] the space curve in accordance with [said] the determined direction.

64. (Amended) A computer program product claimed in claim 63, wherein said second generation means comprises:

means for determining [said] the endpoints of [said] the space curve; and

means for generating one [said] second vector connecting both [said] endpoints.

65. (Amended) A computer program product as claimed in claim 63, wherein said second generating means comprises:

means for determining [said] the endpoints of [said] the space curve; and

means for generating two [said] second vectors, each connecting both [said] endpoints and having opposite directions.

66. (Amended) A computer program product as claimed in claim 65, wherein said first comparison means comprises:

means for determining a first angle between one of [said] the second vectors and [said] the first vector;

means for determining a second angle between the other one of [said] the second vectors and [said] the first vector; and

means for comparing [said] the first angle with [said] the second angle[;],

wherein if [said] the first angle is less than [said] the second angle then the determined direction of the space curve is in a first direction, and if [said] the first angle is greater than [said] the second angle then the determined direction of the space curve is in a second direction, opposite the first direction.

67. (Amended) A computer program product as claimed in claim 64, wherein said first comparison means comprises:

means for determining a first angle between [said] the first vector and [said] the second vector; and

means for comparing [said] the first angle with a first threshold value[;],

wherein if [said] the first angle is less than [said] the first threshold value then the determined direction of the space curve is in a first direction, and if [said] the first angle is greater than [said] the first threshold value then the determined direction of the space curve is in a second direction, opposite the first direction.

68. (Amended) A computer program product as claimed in claim 67, wherein [said] the first threshold value is 90°.

69. (Amended) A computer program product as claimed in claim 66, wherein [said] the computer program product further comprises means for generating a vector orthogonal to [said] the first vector.

70. (Amended) A computer program product as claimed in claim 67, wherein [said] the computer program product further comprises means for generating a vector orthogonal to [said] the first vector.

71. (Amended) A computer program product as claimed in claim 69 or 70, wherein [said] the orthogonal vector is generated in a predetermined manner.

72. (Amended) A computer program product as claimed in claim 69 or 70, wherein [said] the orthogonal vector is generated in accordance with a user selected direction.

73. (Amended) A computer program product as claimed in claim 69, wherein [the] said first comparison means further comprises:

means for determining a third angle between one of [said] the second vectors and [said] the orthogonal vector;

means for determining a fourth angle between the other one of [said] the second vectors and [said] the orthogonal vector; and

means for comparing [said] the third angle with [said] the fourth angle,

wherein if [said] the third angle is less than [said] the fourth angle then the determined direction of the space curve is in a third direction, and if [said] the third angle is greater than [said] the fourth angle then the determined direction of the space curve is in a fourth direction, opposite the third direction.

74. (Amended) A computer program product as claimed in claim 70, wherein [the] said first comparison means further comprises:

means for determining a second angle between [said] the second vector and [said] the orthogonal vector; and

means for comparing [said] the second angle with a second threshold value[;],

wherein if [said] the second angle is less than [said] the second threshold value then the determined direction of the space curve is in a third direction, and if [said] the second angle is greater than [said] the second threshold value then the determined direction of the space curve is in a fourth direction, opposite the third direction.

75. (Amended) A computer program product as claimed in claim 74, wherein [said] the second threshold value is 90°.

76. (Amended) A computer program product as claimed in claim 63, wherein said second generation means comprises:

means for determining endpoints of [said] the space curve; and

means for generating, at each [said] endpoint, a [said] second vector tangent to [said] the space curve.

77. (Amended) A computer program product as claimed in claim 76, wherein said first comparison means comprises:

means for determining a first angle between one of [said] the second vectors and [said] the first vector;

means for determining a second angle between the other one of [said] the second vectors and [said] the first vector; and

means for comparing [said] the first angle with [said] the second angle[;],

wherein if [said] the first angle is less than [said] the second angle then the determined direction of the space curve is in a first direction, and if [said] the first angle is greater than [said] the second angle then the determined direction of the space curve is in a second direction, opposite the first direction.

78. (Amended) A computer program product as claimed in claim 77, wherein said second generation means comprises[:] means for generating one [said] third vector connecting both [said] endpoints.

79. (Amended) A computer program product as claimed in claim 77, wherein said second generation means further comprises[:] means for generating two [said] third vectors, each connecting both [said] endpoints and having opposite directions.

80. (Amended) A computer program product as claimed in claim 79, wherein said first comparison means further comprises:

means for determining a third angle between one of [said] the third vectors and [said] the first vector;

means for determining a fourth angle between the other one of [said] the third vectors and [said] the first vector; and

means for comparing [said] the third angle with [said] the fourth angle[;],

wherein if [said] the third angle is less than [said] the fourth angle then the determined direction of the space curve is in a third direction, and if [said] the third angle is greater than [said] the fourth angle then the determined direction of the space curve is in a fourth direction, opposite the third direction.

81. (Amended) A computer program product as claimed in claim 78, wherein said first comparison means comprises:

means for determining a third angle between [said] the third vector and [said] the first vector; and

means for comparing [said] the third angle with a first threshold value[;],

wherein if [said] the third angle is less than [said] the first threshold value then the determined direction of the space curve is in a third direction, and if [said] the third angle is greater than [said] the first threshold value then the determined direction of the space curve is in a fourth direction, opposite the third direction.

82. (Amended) A computer program product as claimed in claim 81, wherein [said] the first threshold value is 90°.

83. (Amended) A computer program product as claimed in claim 80, wherein said second generation means comprises[:] means for generating a vector orthogonal to [said] the first vector.

84. (Amended) A computer program product as claimed in claim 81, wherein said second generation means comprises[:] means for generating a vector orthogonal to [said] the first vector.

85. (Amended) A computer program product as claimed in claim 83 or 84, wherein [said] the orthogonal vector is generated in a predetermined manner.

86. (Amended) A computer program product as claimed in claim 83 or 84, wherein [said] the orthogonal vector is generated in accordance with a user selected direction.

87. (Amended) A computer program product as claimed in claim 83, wherein [the] said first comparison means further comprises:

means for determining a fifth angle between [said] the first one of [said] the third vectors and [said] the orthogonal vector;

means for determining a sixth angle between [said] the other one of [said] the third vectors and [said] the orthogonal vector; and

means for comparing [said] the fifth angle with [said] the sixth angle,

wherein if [said] the fifth angle is less than [said] the sixth angle then the determined direction of the space curve is in a fifth direction, and if [said] the fifth angle is greater than [said] the sixth angle then the determined direction of the space curve is in a sixth direction, opposite the fifth direction.

88. (Amended) A computer program product as claimed in claim 84, wherein [the] said first comparison means further comprises:

means for determining a fourth angle between [said] the third vector and [said] the orthogonal vector; and

means for comparing [said] the fourth angle with a second threshold value[;],

wherein if [said] the fourth angle is less than [said] the second threshold value then the determined direction of the space curve is in a fourth direction, and if [said] the fourth angle is greater than [said] the second threshold value then the determined direction of the space curve is in a fifth direction, opposite the fourth direction.

89. (Amended) A computer program product as claimed in claim 88, wherein [said] the second threshold value is 90°.

90. (Amended) A computer program product as claimed in claim 63, wherein the computer program product comprises means for providing further space curves and performing the operations of [the] said second generation means, first comparison means and orientation means on each space curve.

91. (Amended) A computer program product as claimed in claim 63, wherein the computer program product comprises a plurality of techniques for generating the second vectors and means for selecting one of [said] the techniques in response to user input.

92. (Canceled)

93. (Canceled)